

P948

[3664] - 215

B.E. (Electronics)

EMBEDDED SYSTEMS DESIGN

(2003 Course)

Sem I (Elective I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answer any three questions from each section.
- 2) Answer three questions from Section - I and three questions from Section - II.
- 3) Answers to the two sections should be written in separate books.
- 4) Neat diagrams must be drawn wherever necessary.
- 5) Figures to the right indicate full marks.
- 6) All questions carry equal marks.
- 7) Your answers will be valued as a whole.
- 8) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 9) Assume suitable data, if necessary.

**SECTION - I**

- Q1) a) Explain the architecture of a general purpose embedded system. [8]
- b) What do you mean by design metric? Explain the following design metrics.
- i) Power.
  - ii) Time to market.
  - iii) Safety.
  - iv) Maintainability. [10]

OR

- Q2) a) Explain the architecture of IEEE 802.11. [8]
- b) Explain the protocol architecture of IrDA. Compare short CAN and MODBUS serial communication. [10]

- Q3) a) Explain the software architecture of an embedded system. [6]  
b) Describe the processor selection criteria for an embedded system for any three systems. [10]

OR

- Q4) a) Explain the architecture of N/W processor. [8]  
b) What is interrupt latency? Explain the difference between interrupt latency for processor and operating system. Explain different I/O devices. [8]

- Q5) a) Explain the following : [8]  
i) Semaphores for RTOS.  
ii) Mail-box for RTOS.  
b) Discuss the guidelines for code optimization. [8]

OR

- Q6) a) Explain the characteristics of round-robin interrupt architecture. [8]  
b) Differentiate ISR task, threads and processes. Define & explain context switching. [8]

## SECTION - II

- Q7) a) Distinguish: pre-emptive and non-pre-emptive scheduling. [6]  
b) How data output generated for a IPC in process transfer. [6]  
c) Explain Rate Monotonic Analysis (RMA). [6]

OR

- Q8) a) Explain the objects of kernel in operating system. [8]  
b) What do you mean by shared data bugs? Explain. [6]  
c) Explain 'deadly embracing'. [4]

- Q9) a) Explain the features of real time system development. [4]  
b) Explain in brief RT-Linux module. [4]  
c) Explain the application areas of RT-Linux. [8]

OR

- Q10*) a) What is  $\mu$ C/OS II? Explain the features of  $\mu$ C/OS II. [8]  
b) Explain following for  $\mu$ C/OS II : [8]  
i) Time-delay functions.  
ii) Task-related function.
- Q11*) a) Explain in detail basic features of smart card hardware. [8]  
b) Explain the functioning of RFID system. [8]

OR

- Q12*) Explain the embedded system used in digital camera. [16]

